

REMARKS

In the Final Office Action, the Examiner took the following actions:

(a) rejected claims 1-3 and 5-7 under 35 U.S.C. § 102(b) as being anticipated by Magome et al. (U.S. Patent Application Publication No. 2002/0187406 A1) ("Magome"); and

(b) rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Magome in view of one or more of: Pierrat (U.S. Patent Application Publication No. 2003/0154461 A1) ("Pierrat"), Jessen et al. (U.S. Patent Application Publication No. 2004/0058255 A1) ("Jessen") and/or Egorov et al. (U.S. Patent Application Publication No. 2004/0123266 A1) ("Egorov").

Claims 8-20 stand withdrawn from consideration, and claims 1-7 remain pending and under current examination.

Rejection under 35 U.S.C. § 102(b)

Applicants request reconsideration and withdrawal of the rejection of claims 1-3 and 5-7 under 35 U.S.C. § 102(b) as being anticipated by Magome.

In order to properly establish anticipation under 35 U.S.C. § 102, the Federal Circuit has held that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989). See also M.P.E.P. § 2131.

Magome does not disclose each and every element of Applicants' claimed invention, despite the Examiner's allegations. Specifically, Magome at least does not disclose Applicants' claimed "generating resized data by enlarging the design patterns

of the design data” (as recited in claim 1). Magome teaches “segment[ing] a second pattern (36) obtained by further enlarging an enlarged first pattern (27) of the predetermined pattern” (para. [0056]).

Applicants assert that the paragraphs cited by the Examiner -- [0002] - [0003], [0056] and Figs. 1 and 5-7 -- do not disclose Applicants’ claimed “generating resized data by enlarging the design patterns of the design data.”

Furthermore, Magome does not disclose Applicants’ claimed “generating first mask data by filling a space area between the enlarged design patterns” (as recited in claim 1).

Magome teaches “segment[ing] a parent pattern which is an α -magnification of an original pattern which is a β -magnification of a circuit pattern into α lengthwise and breadthwise, thereby forming parent patterns on data” (Abstract). Specifically, discussing Fig. 7, the reference discloses that:

the circuit pattern 35 is magnified by β to form the original pattern 27 that has a rectangular area whose perpendicular sides have widths of $\beta \cdot dX$ and $\beta \cdot dY$, on image data and then the original pattern 27 is magnified by α to form the parent pattern 36 that has a rectangular area whose perpendicular sides have widths of $\alpha \cdot \beta \cdot dX$ and $\alpha \cdot \beta \cdot dY$. Then, the parent pattern 36 is divided to form $\alpha \times \alpha$ parent patterns P1, P2, P3, . . . , PN . . ., and those parent patterns P_i ($i=1$ to N) are transferred in equal magnification on the master reticles R_i as the first set of N parent masks. . . .

Then, by using the write data of the parent patterns p_1 [sic], P_2 , . . . , P_N segmented from the parent pattern 36 again, the parent patterns P_i are transferred in equal magnification on the master reticles Q_i as the second set of N parent masks. The parent patterns P_1 to P_N on the second set of master reticles Q_1 to Q_N will be called below ‘parent patterns A1-AN’ for the purpose of distinction. . . .

. . . [T]he amount of each write data for each of the parent patterns P_i and A_i is reduced by about $1/\alpha^2$ as compared

with that for the original pattern 27 and the minimum line width is α times the minimum line width of the original pattern 27, so that each parent pattern P_i , A_i can be written in a short period of time and with a high precision.

See Magome, para. [0132]-[0134], emphasis added.

Magome teaches magnification and reduction of a pattern of equal magnification at each step of the production of parent pattern 36 and segmenting parent pattern 36 to produce master reticles Q_i . Magome, however, does not teach “generating first mask data by filling a space area between the enlarged design patterns,” as recited in claim 1.

Applicants also assert that the portions of Magome cited by the Examiner -- Abstract, paragraphs [0003], [0006], [0022], [0023], [0056], [0223], [0224], and [0226] and Figs. 1 and 5-7 -- do not disclose Applicants’ claimed “generating first mask data by filling a space area between the enlarged design patterns.”

Since Magome does not disclose each and every element of claim 1, Magome does not anticipate claim 1 under 35 U.S.C. § 102(b). Accordingly, claim 1 is allowable over Magome. Claims 2, 3 and 5-7 are also allowable at least by virtue of their dependence from base claim 1. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(b) rejection of claims 1-3 and 5-7.

Rejection under 35 U.S.C. § 103(a)

Applicants request reconsideration and withdrawal of the rejection of claim 4 under 35 U.S.C. § 103(a) as being unpatentable over Magome in view of one or more of Pierrat, Jessen and/or Egorov. A *prima facie* case of obviousness has not been established.

To establish a *prima facie* case of obviousness, the prior art references (separately or in combination) must teach or suggest all the claim limitations. See

M.P.E.P. § 2142, 8th Ed., Rev. 5 (August 2006). “[I]n formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.” *USPTO Memorandum* from Margaret A. Focarino, Deputy Commissioner for Patent Operations, May 3, 2007, p. 2. “[T]he analysis supporting a rejection ... should be made explicit” and it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the manner claimed.” *Id.* (citing *KSR Int’l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007)).

A *prima facie* case of obviousness has not been established for at least the reason that the prior art, taken separately or in combination, fails to teach or suggest each and every element recited in claim 4. The Examiner asserts that each of Pierrat, Jessen, and Egorov discloses use of OPC for various purposes. While Applicants acknowledge, but do not acquiesce to, the Examiner’s characterizations of the references, Applicants assert that the references, taken separately or in combination, do not teach or suggest at least Applicants’ claimed “generating first mask data by filling a space area between the enlarged design patterns,” as recited in claim 1 and required by claim 4. Therefore, Pierrat, Jessen, and Egorov, either separately or combined, fail to cure the deficiencies of Magome.

Moreover, Applicants respectfully disagree with the Examiner’s characterization that “[i]t would have been obvious to one of ordinary skill in the art at the time of the applicant’s invention to have utilized performing OPC” (Final Office Action at 4).

Applicants note that Pierrat teaches specifying “. . . ‘proximity effect halos’ . . . in an IC layout data file,” where the “halos represent the areas around tight tolerance layout features” (para. [0016]). Pierrat also recites “a reticle can include” first, second and third “set[s] of layout features,” with the “second set of layout features being within a proximity effect halo of the first set of layout features” (para. [0019]).

Jessen teaches “compensating for surface topography at mask design and providing a method for optical proximity correction of a mask” (para. [0006]). Jessen also teaches “OPC models that link deterministically predicted topography maps . . . to measured CD (or scale) responses of the photoresist system” (para. [0007]).

Egorov teaches that “[e]ach design element . . . is assigned a name or call” (para. [0025]), “a local cover area . . . for each call” is defined (para. [0035]) and “an OPC procedure for one local cover area in each group” is performed (Claim 1).

Applicants note that each of Pierrat, Jessen, and Egorov disclose the use of OPC for a particular application. However, the uses of OPC disclosed in these references do not teach or suggest performing OPC “on the first mask data and the second mask data,” as recited in claim 4, or with regards to “generating first mask data by filling a space area between the enlarged design patterns,” as recited in claim 1.

Therefore, for these additional reasons, the Examiner’s asserted combination of Magome with one or more of Pierrat, Jessen, and/or Egorov fails to disclose or suggest each and every element of claim 4.

Furthermore, in view of the specific application of OPC disclosed in each of Pierrat, Jessen, and Egorov, Applicants assert that a person of ordinary skill would not

have been motivated to combine any of Pierrat, Jessen, and Egorov with Magome to implement OPC therein.

Therefore, a *prima facie* case of obviousness has not been established, for at least the reasons noted above. Claim 4 should therefore be allowable under 35 U.S.C. § 103(a). Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection for claim 4.

Conclusion:

In view of the foregoing amendments and remarks, Applicants request reconsideration of the application and withdrawal of the rejections. Pending claims 1 - 7 are in condition for allowance, and Applicants request a favorable action.

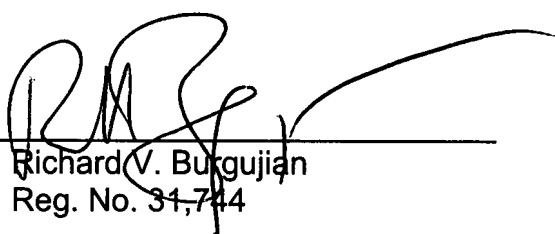
Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916

Respectfully submitted,

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